

Harness repair manual

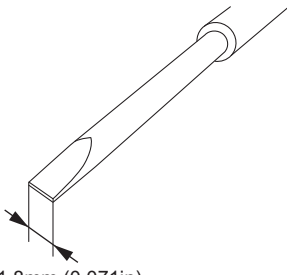
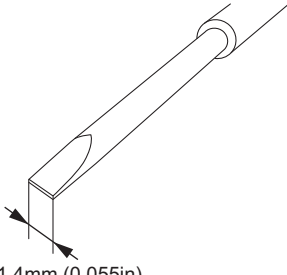
	Page
1. Precautions before starting work.....	2
2. Preparation items	3
3. Replacement parts.....	5
4. Connector replacement.....	7

1. Precautions before starting work


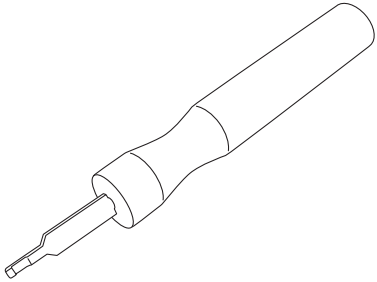
- When conducting harness repair work, do not make changes or improvements to the circuitry. Doing so may lead to a malfunction or a fire due to the harness overheating.
- Before starting work, please refer to the “General Description”, “Repair Contents”, “NOTE”, and “TROUBLESHOOTING OF ELECTRICAL SYSTEM” sections in the service manual.

2. Preparation items

A: General tools

Illustration	Description	Remarks
 <p>1.8mm (0.071in)</p> <p>WI-78764</p>	Precision screwdriver (general purpose) Tip width of 1.8 mm (0.071 in) or less.	Removing retainers.
 <p>1.4mm (0.055in)</p> <p>WI-78765</p>	Precision screwdriver (general purpose) Tip width of 1.4 mm (0.055 in) or less.	Removing terminals.
-	Hexagonal wrench: 2 mm (0.08 in) or less.	Removing waterproof plugs.
-	Harness tape (general purpose)	Protecting or securing the harness.

B: Special tools

Illustration	Tool number	Description	Remarks
 <p>STSSM4</p>	-	SUBARU SELECT MONITOR 4	<p>Used for setting of each function and troubleshooting for the electrical system.</p> <p>NOTE:</p> <ul style="list-style-type: none"> For detailed operation procedures, please refer to "Help" for the application. Use this together with the SSM interface (DST-i, DST-010, or the like).
 <p>WI-85571</p>	99804AA0000	RETAINER REMOVER	<p>Used for removing retainers from the front oxygen (A/F) sensor (99801AA140) and rear oxygen sensor (99801AA150).</p> <p>NOTE:</p> <p>The tip of the special tool is very small and not very durable, since it was designed to fit the shape of the connector retainer. Thus, the tip may deform (bend or warp) if the tool is used repeatedly. If the tip is deformed, be sure to straighten it before using the tool again.</p> <p>However, Subaru will not be responsible for any damage caused by repeated deformations (bending or warping) during use and its repairs.</p>

3. Replacement parts

Connectors that can be replaced

If any of the following connectors fail, it is possible to obtain replacement parts.

Connector name	Replacement part No.	Replacement part name	Connector manufacturer	Connector manufacturer part number			Poles
				Housing	Retainer	Housing & retainer	
Headlight	99801AA020	Repair harness connector	Yazaki Corporation	-	-	7283-1407-40	10
	99801AA000	Repair harness connector	Yazaki Corporation	-	-	7283-1289-40	8
	99801AA010	Repair harness connector	Yazaki Corporation	-	-	7283-7062-30	6
	99801AA100	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0715	16
	99801AA110	Repair harness connector	Yazaki Corporation	-	-	7283-1289-30	8
	99801AA430	Repair harness connector	Yazaki Corporation	-	-	7283-7080-40	8
	99801AA440	Repair harness connector	Yazaki Corporation	7283-1927-30	7157-6826-80	-	2
	99801AA470	Repair harness connector	Sumitomo Wiring Systems	-	-	6195-0152	12
Front fog light	99801AA040	Repair harness connector	Sumitomo Wiring Systems	6189-0935	6918-1922	-	2
Daytime running light	99801AA050	Repair harness connector	Delphi	-	-	F487000	2
Main fan motor	99801AA060	Repair harness connector	Sumitomo Wiring Systems	6185-0867	6918-1774	-	2
	99801AA120	Repair harness connector	Yazaki Corporation	7123-6423-30	7157-6720	-	2
	99801AA450	Repair harness connector	Furukawa Electric Co., Ltd.	S120479	S120500	-	2
	99801AA460	Repair harness connector	Furukawa Electric Co., Ltd.	S120174	S120184	-	2
Main fan motor harness	99801AA490	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-1048	4
Sub fan motor	99801AA060	Repair harness connector	Sumitomo Wiring Systems	6185-0867	6918-1774	-	2
	99801AA130	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0482	2
	99801AA450	Repair harness connector	Furukawa Electric Co., Ltd.	S120479	S120500	-	2
	99801AA460	Repair harness connector	Furukawa Electric Co., Ltd.	S120174	S120184	-	2
Sub fan motor harness	99801AA490	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-1048	4
Front harness	99801VC010	Repair harness connector	Yazaki Corporation	-	-	7282-7040-30	4
	99801VC020	Repair harness connector	Yazaki Corporation	-	-	7283-7043-30	4

Connector name	Replacement part No.	Replacement part name	Connector manufacturer	Connector manufacturer part number			Poles
				Housing	Retainer	Housing & retainer	
Front oxygen (A/F) sensor	99801AA070	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0509	4
	99801AA140	Repair harness connector	Sumitomo Wiring Systems	6181-0664	6918-1600	-	6
Rear oxygen sensor	99801AA080	Repair harness connector	Sumitomo Wiring Systems	-	-	6189-0581	4
	99801AA150	Repair harness connector	Sumitomo Wiring Systems	6181-0513	6918-1598	-	4
Ignition coil	99801AA090	Repair harness connector	JST	-	-	03NFG-B-1A	3

For more information regarding harness repair connectors for each vehicle model, please refer to the “Body & Electrical / WIRING DIAGRAM”, “WIRING DIAGRAM”, “Harness Repair Kit”, “SPECIFICATION”, and “APPLICATION CHART” sections in the service manual.

4. Connector replacement

Precautions for connector replacement work

- Be sure to turn the ignition switch to OFF and disconnect the negative terminal of the battery before starting work.
- If the connector is damaged, perform a visual inspection of the harness to confirm that it is not damaged.
- Make sure that the fuse is not blown.
- If there are any abnormalities such as deformation or damage to the terminal or waterproof plug, repair by replacing the entire harness assembly without replacing the connector.
- Do not cut the harness as the terminal parts are not included with the repair harness connector.
- When peeling off the harness tape and protective element to make it easier to work, ensure that the repair and waterproofing work of the portion where the harness tape and protective element were peeled is appropriately carried out.

A: Detaching the connector

NOTE:

Thoroughly wipe any dirt or oil off the harness to be repaired.

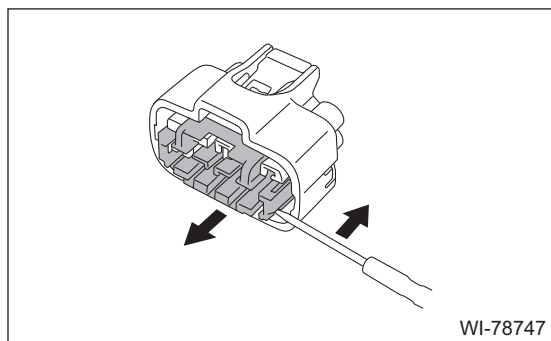
- 1) Remove all of the parts attached to the connector to be replaced.
- 2) Disconnect the connector.
- 3) Undo all fasteners such as clips and pull out the connector.

B: Releasing the terminal retainer

- 1) Release the retainer from the housing (connector).

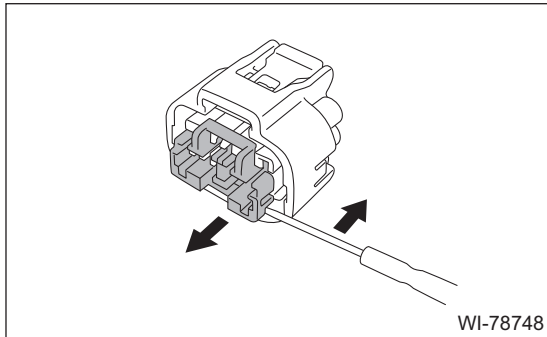
CAUTION:

- Be careful not to deform or damage the terminal when removing the retainer.
 - Before removing the retainer, make a note of the connector terminal arrangement and wire colors.
 - Be careful not to assemble the wires erroneously because the same-color wires may be used in the connector.
- 2) Removal method for each connector.
 - (1) Headlight (99801AA020)
 - Pry out the left and right sides of the retainer.



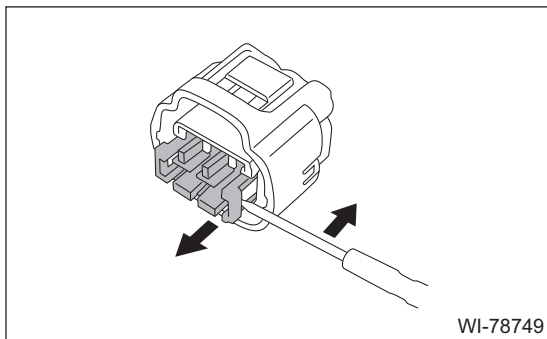
(2) Headlight (99801AA000)

- Pry out the left and right sides of the retainer.



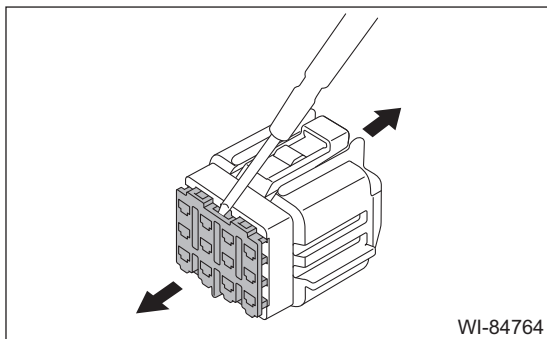
(3) Headlight (99801AA010)

- Pry out the left and right sides of the retainer.



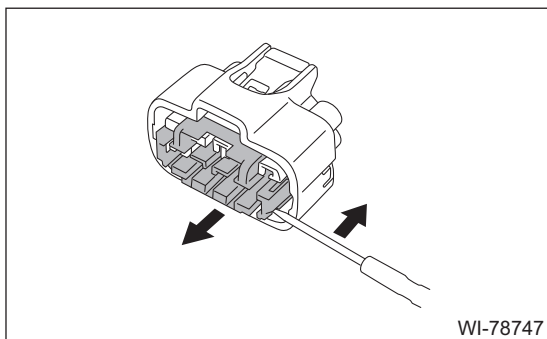
(4) Headlight (99801AA100)

- Pry out the top side of the retainer.



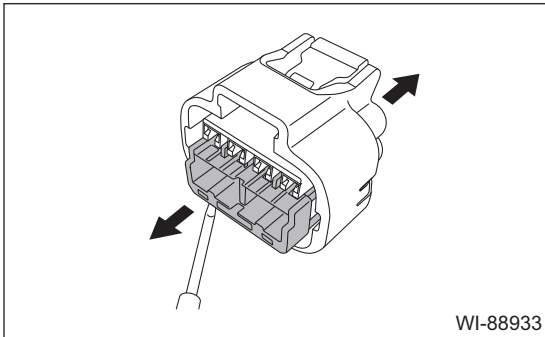
(5) Headlight (99801AA110)

- Pry out the left and right sides of the retainer.



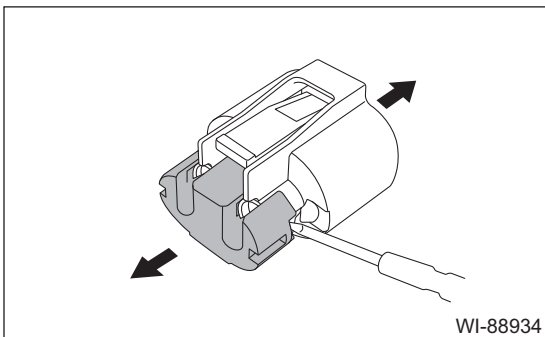
(6) Headlight (99801AA430)

- Pry out the bottom side of the retainer.



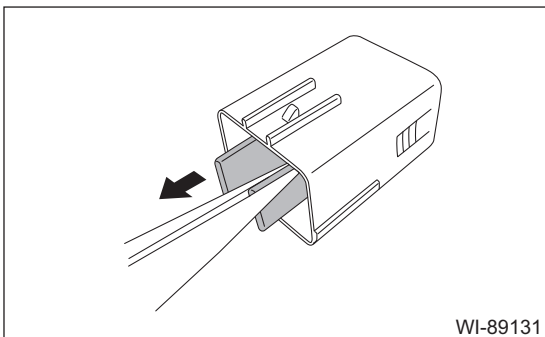
(7) Headlight (99801AA440)

- Pry out the left and right sides of the retainer.



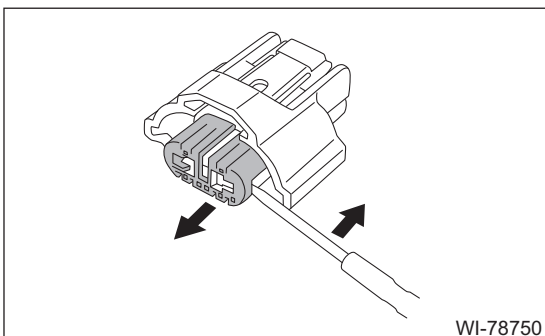
(8) Headlight (99801AA470)

- Pinch the retainer with needle nose pliers, and pull it out straight.



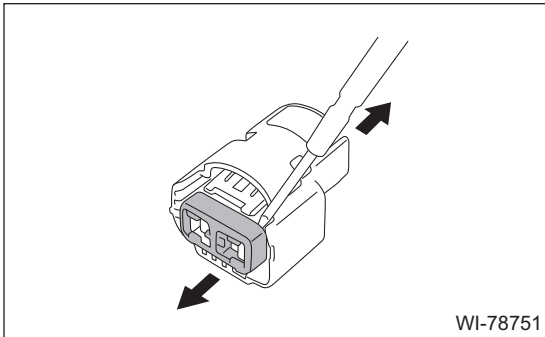
(9) Front fog light (99801AA040)

- Pry out the left and right sides of the retainer.



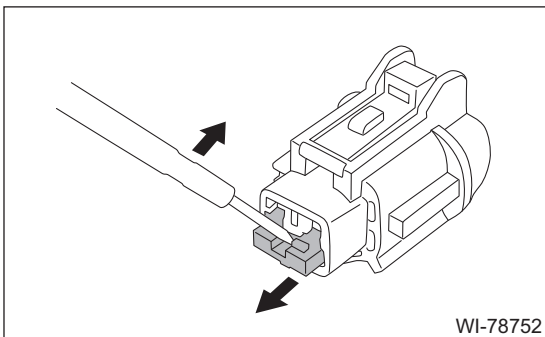
(10) Daytime running light (99801AA050)

- Pry out the left and right diagonal corners of the retainer.



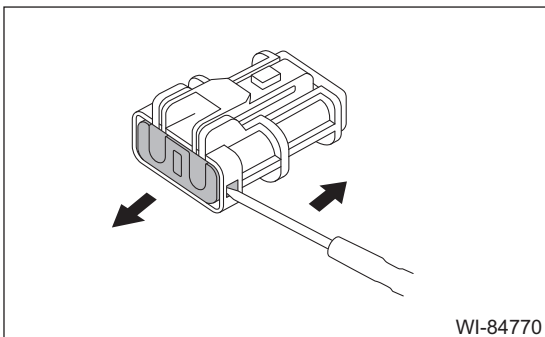
(11) Main fan motor (99801AA060)

- Pry out the top side of the retainer.



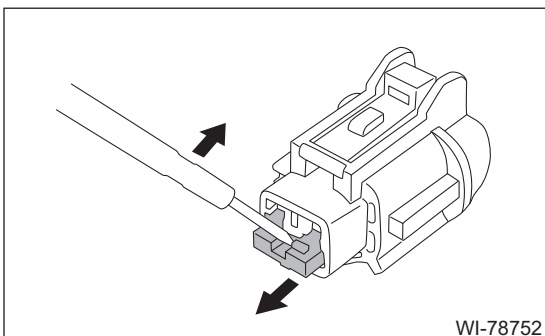
(12) Main fan motor (99801AA120)

- Pry out the left and right sides of the retainer.



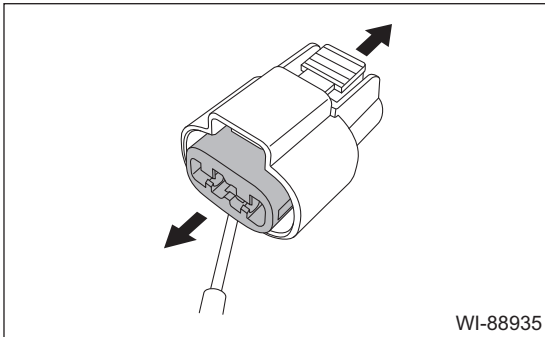
(13) Main fan motor (99801AA450)

- Pry out the top side of the retainer.



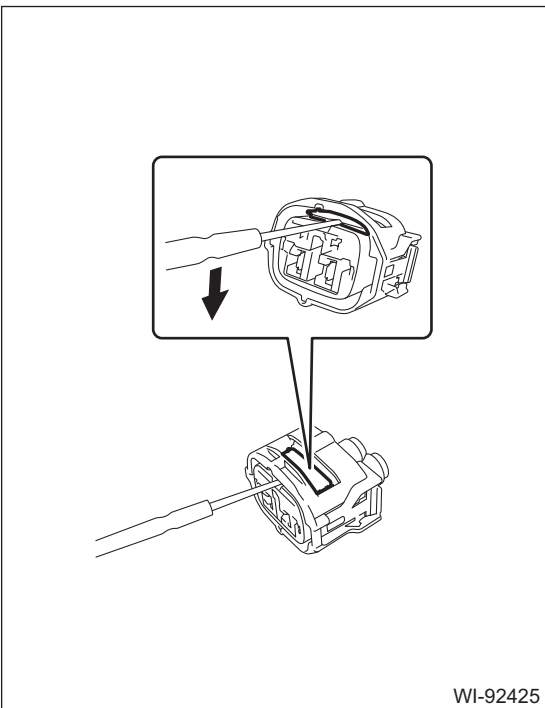
(14) Main fan motor (99801AA460)

- Pry out the bottom side of the retainer.

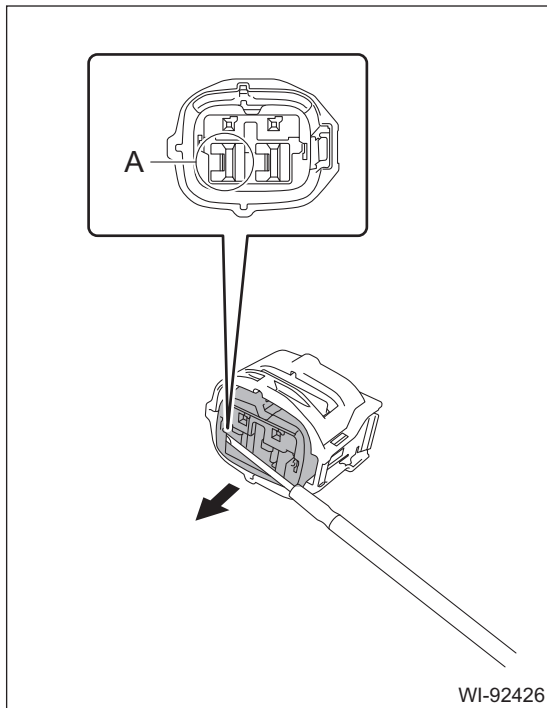


(15) Main fan motor harness (99801AA490)

1. Release the retainer lock.

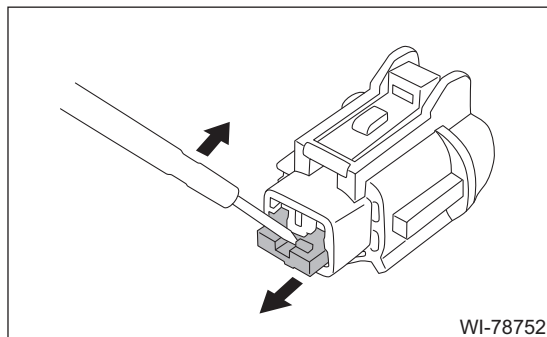


2. Insert the precision screwdriver into the terminal release hole A, check that the precision driver is firmly applied against the retainer, and then slowly pull it out toward you.



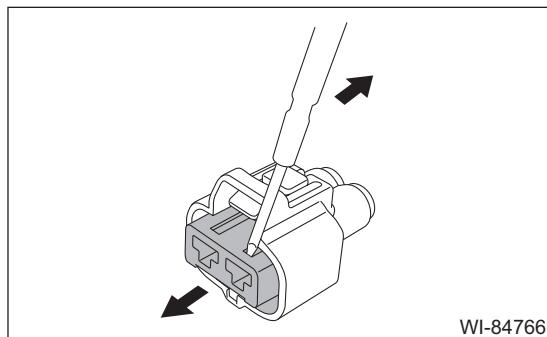
(16) Sub fan motor (99801AA060)

- Pry out the top side of the retainer.



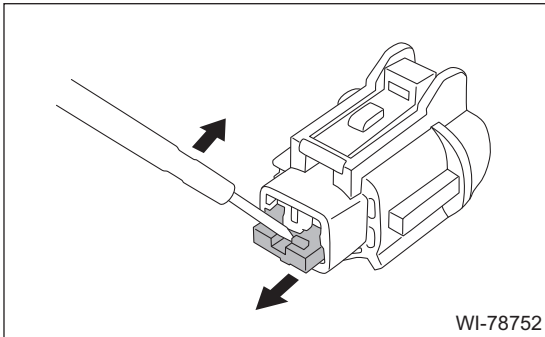
(17) Sub fan motor (99801AA130)

- Pry out the top side of the retainer.



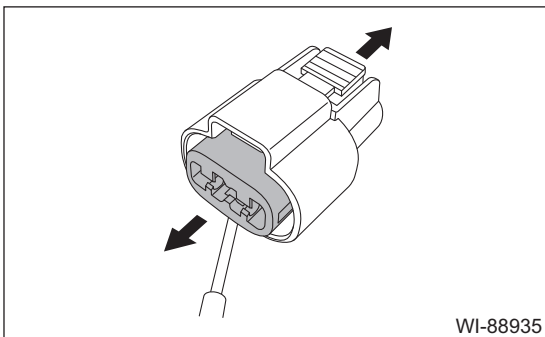
(18) Sub fan motor (99801AA450)

- Pry out the top side of the retainer.



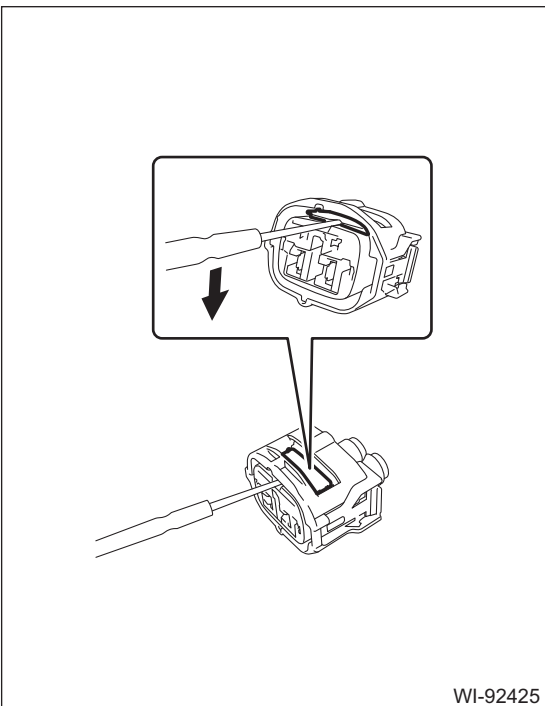
(19) Sub fan motor (99801AA460)

- Pry out the bottom side of the retainer.

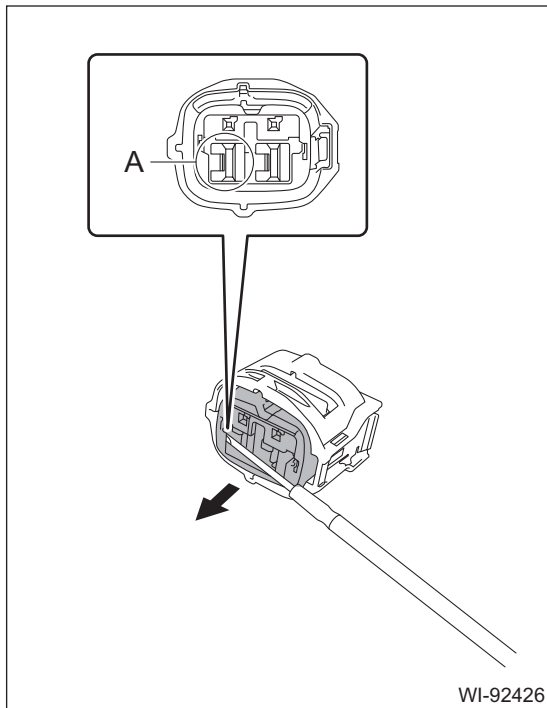


(20) Sub fan motor harness (99801AA490)

1. Release the retainer lock.

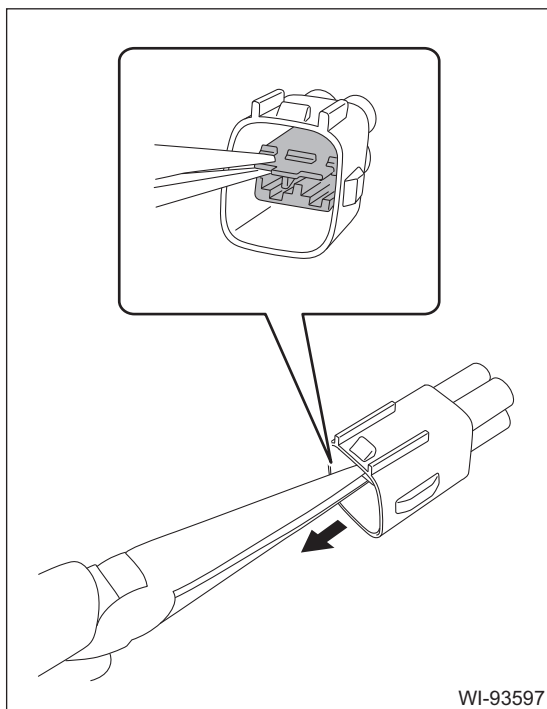


2. Insert the precision screwdriver into the terminal release hole A, check that the precision driver is firmly applied against the retainer, and then slowly pull it out toward you.



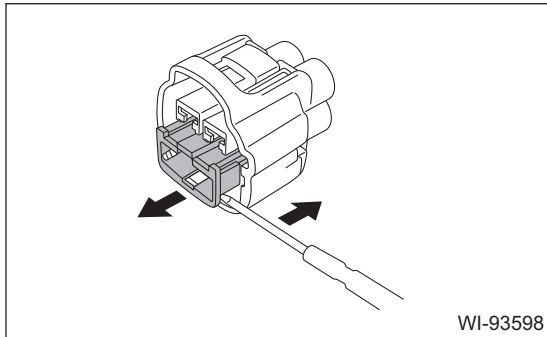
(21) Front harness (99801VC010)

- Release the retainer lock.



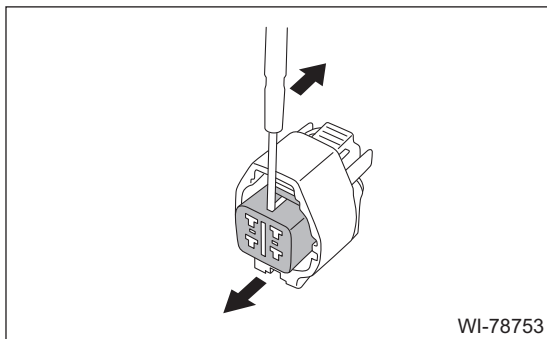
(22) Front harness (99801VC020)

- Release the retainer lock.



(23) Front oxygen (A/F) sensor (99801AA070)

- Pry out the top and bottom sides of the retainer.

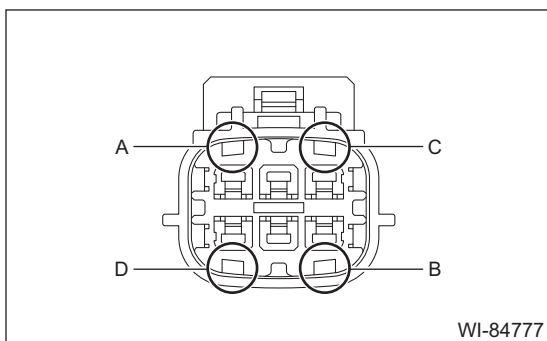


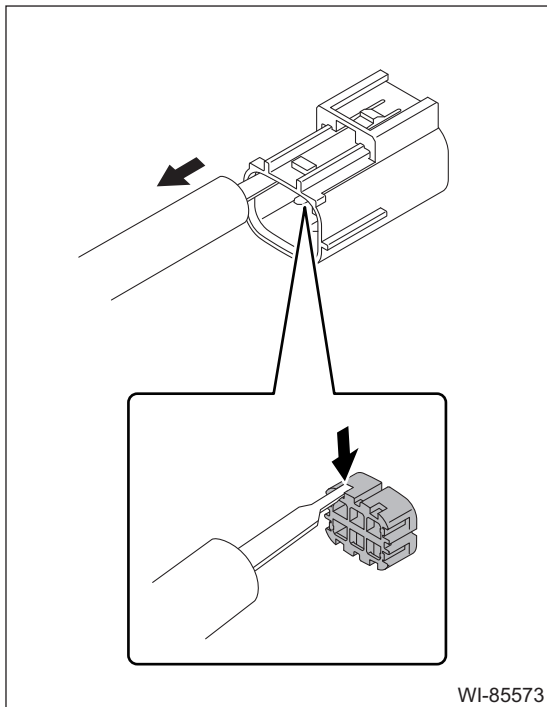
(24) Front oxygen (A/F) sensor (99801AA140)

- Insert the special tool into the retainer release hole A or B. Make sure the special tool is firmly attached to the retainer, and then slowly pull the retainer out.

CAUTION:

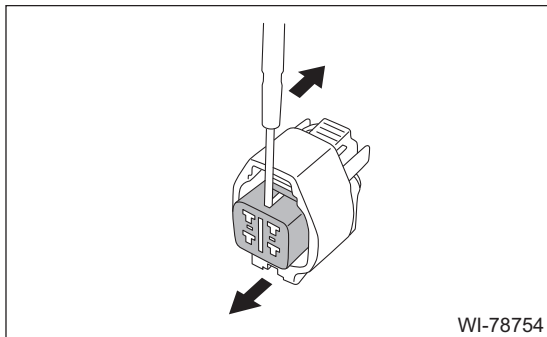
If you pull the retainer with the special tool inserted into hole C or D, you can damage the retainer. Do not use holes C and D.





(25) Rear oxygen sensor (99801AA080)

- Pry out the top and bottom sides of the retainer.

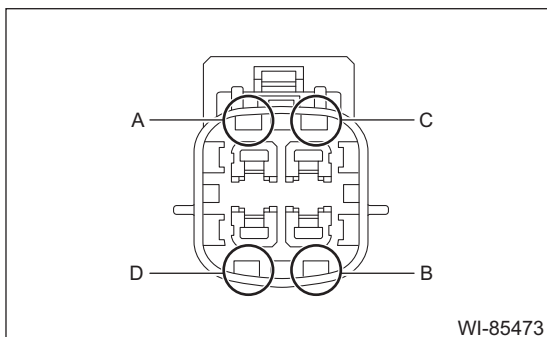


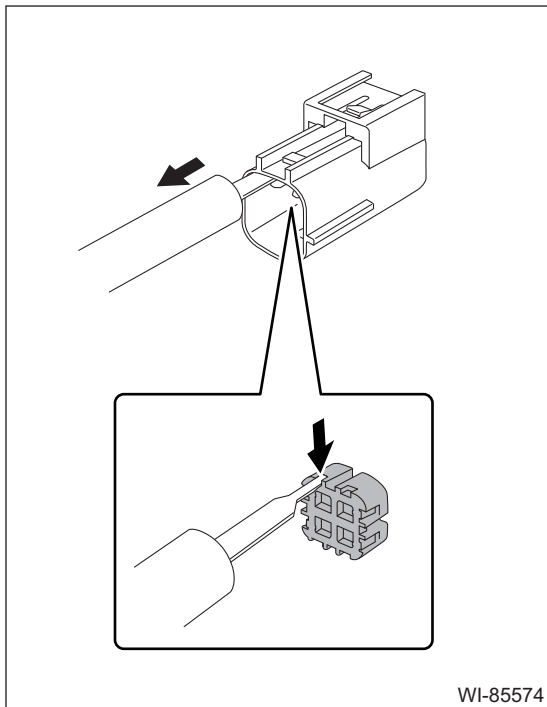
(26) Rear oxygen sensor (99801AA150)

- Insert the special tool into the retainer release hole A or B. Make sure the special tool is firmly attached to the retainer, and then slowly pull the retainer out.

CAUTION:

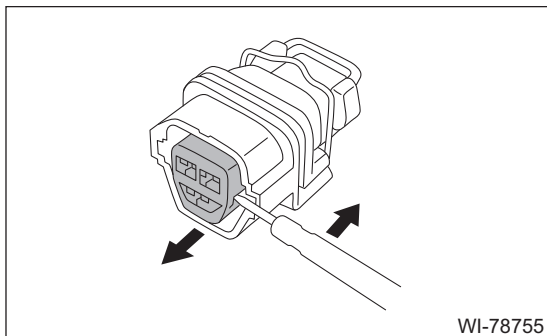
If you pull the retainer with the special tool inserted into hole C or D, you can damage the retainer. Do not use holes C and D.





(27) Ignition coil (99801AA090)

- Pry out the left and right sides of the retainer.



C: Removing terminals

CAUTION:

If the terminal is deformed, replace the entire harness assembly.

- 1) Ensure that the terminal remains pressed against the housing.
- 2) Check the cross section of each connector and release the terminal locking mechanism using a precision screwdriver.
- 3) Once the terminal locking mechanism is released, pull out the terminal from the housing.

NOTE:

To prevent erroneous connection to the connector with many poles, make sure to pull out one terminal at a time to transfer to a new connector.

- 4) If it is not possible to pull out the terminal, repeat the procedure from the start.

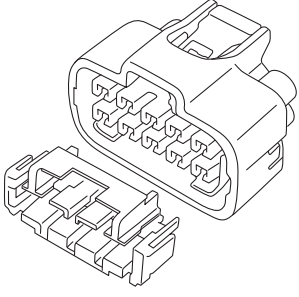
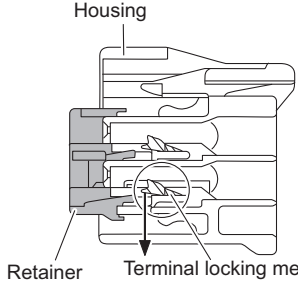
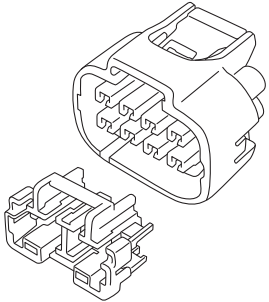
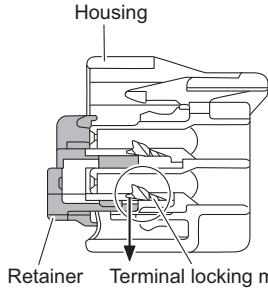
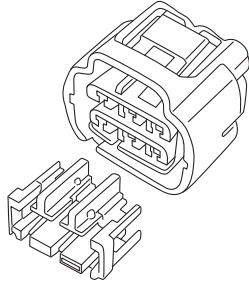
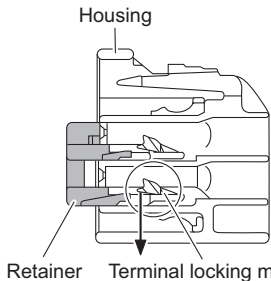
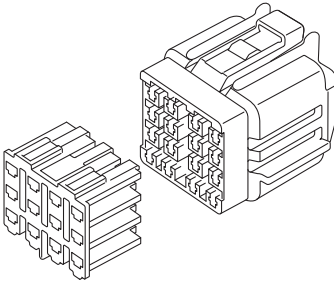
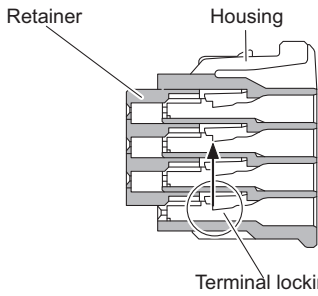
CAUTION:

- Do not forcefully pry out or strongly pull on the terminal.
- Ensure that tools such as the precision screwdriver used to pull out the terminal do not come into contact with the terminal contacts.

NOTE:

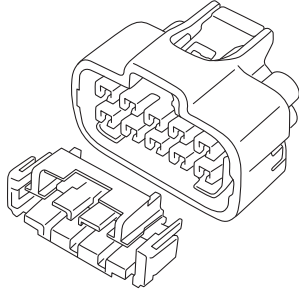
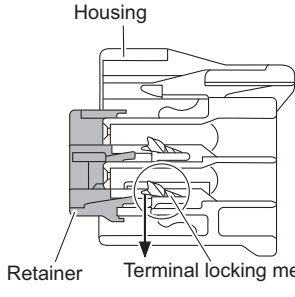
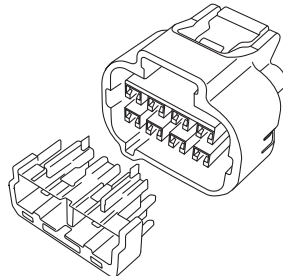
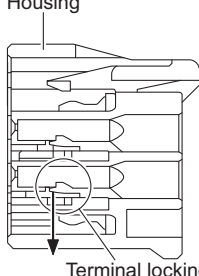
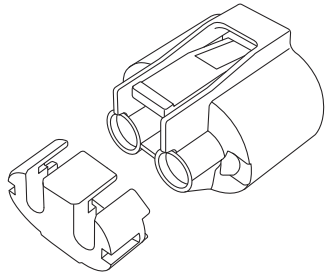
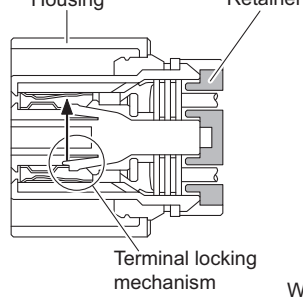
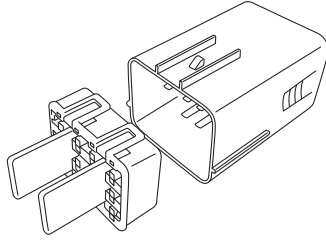
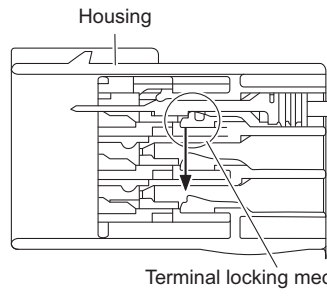
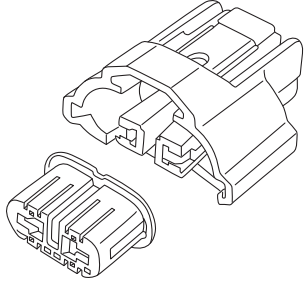
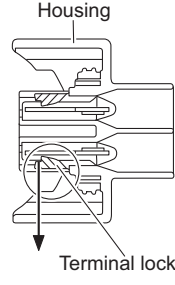
If the distance from the connector to the end of the harness tape and protective element is too short causing it to become difficult to remove the terminal, peel off some of the harness tape and protective element to make it easier to pull out the terminal.

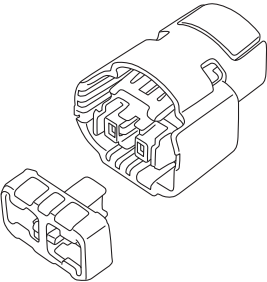
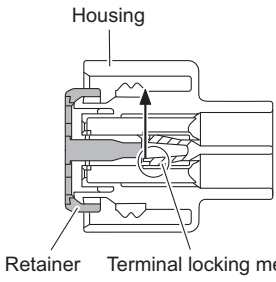
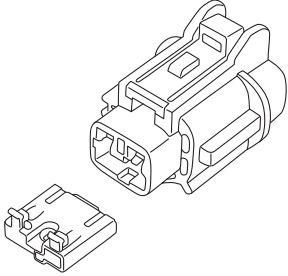
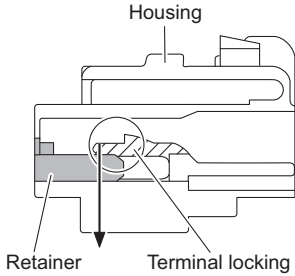
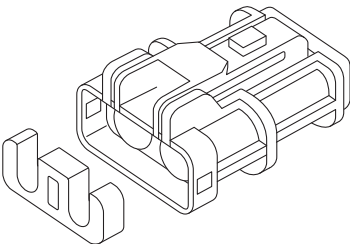
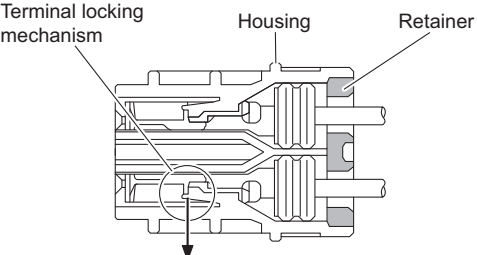
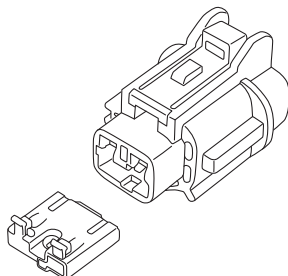
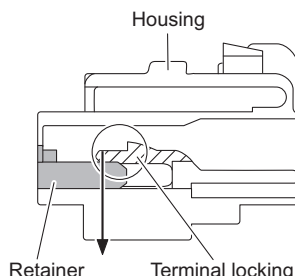
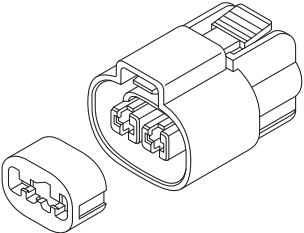
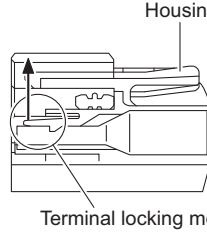
5) Shape and cross section of each connector

Connector type	Connector shape	Cross section
1) Headlight (99801AA020)	 WI-78766	 Housing Retainer Terminal locking mechanism WI-78775
2) Headlight (99801AA000)	 WI-78767	 Housing Retainer Terminal locking mechanism WI-78776
3) Headlight (99801AA010)	 WI-78768	 Housing Retainer Terminal locking mechanism WI-78777
4) Headlight (99801AA100)	 WI-84765	 Retainer Housing Terminal locking mechanism WI-84779

Connector replacement

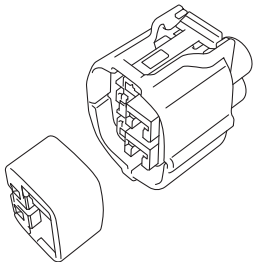
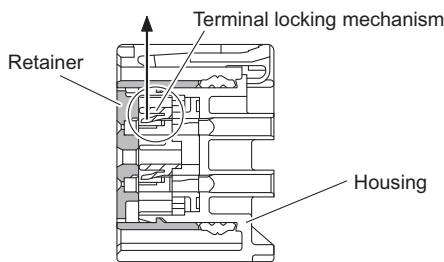
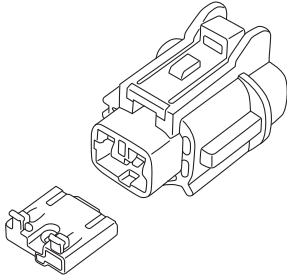
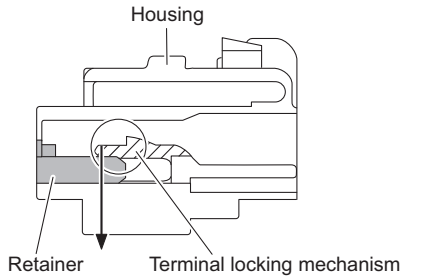
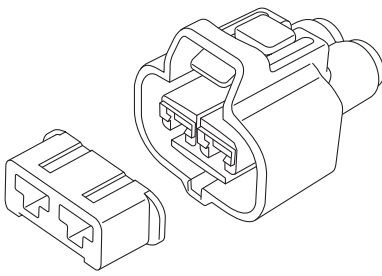
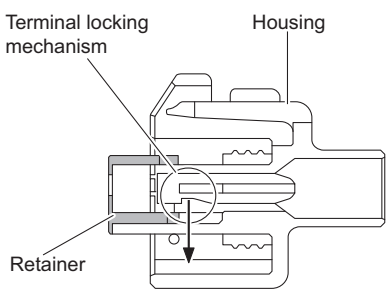
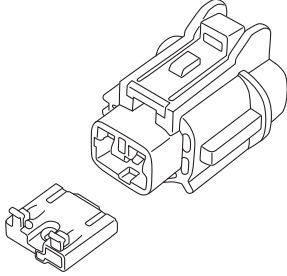
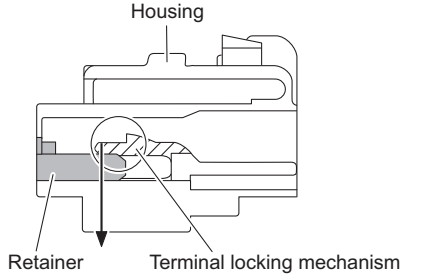
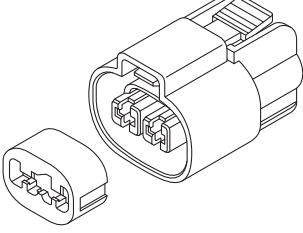
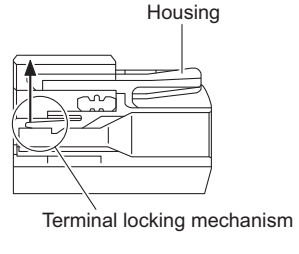
Harness repair manual

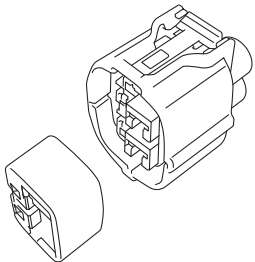
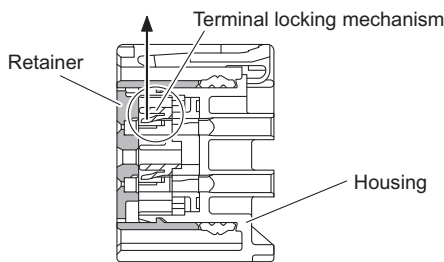
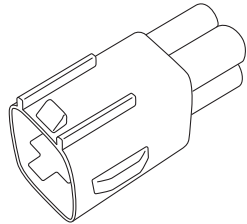
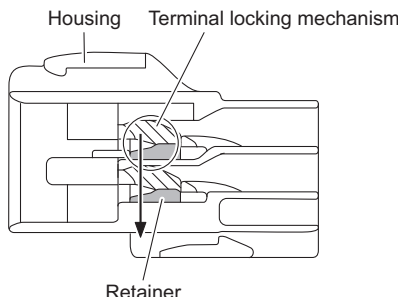
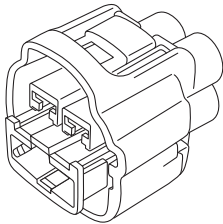
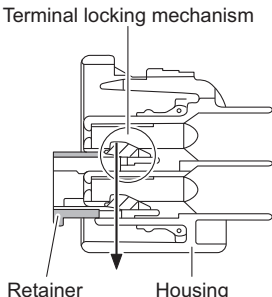
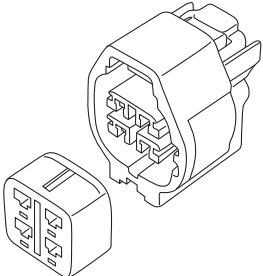
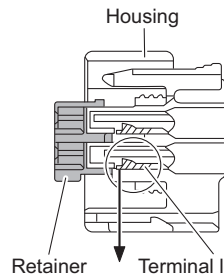
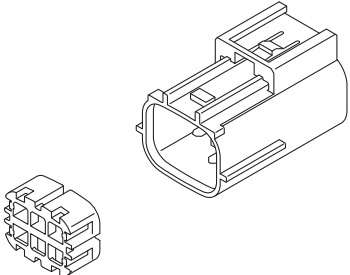
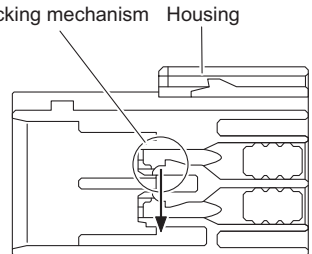
Connector type	Connector shape	Cross section
5) Headlight (99801AA110)	 WI-78766	 Housing Retainer Terminal locking mechanism WI-78775
6) Headlight (99801AA430)	 WI-88936	 Housing Terminal locking mechanism WI-88937
7) Headlight (99801AA440)	 WI-88938	 Housing Retainer Terminal locking mechanism WI-88939
8) Headlight (99801AA470)	 WI-89132	 Housing Terminal locking mechanism WI-89133
9) Front fog light (99801AA040)	 WI-78769	 Housing Terminal locking mechanism WI-78778

Connector type	Connector shape	Cross section
10) Daytime running light (99801AA050)	 WI-78770	 Housing Retainer Terminal locking mechanism WI-78779
11) Main fan motor (99801AA060)	 WI-78771	 Housing Retainer Terminal locking mechanism WI-78780
12) Main fan motor (99801AA120)	 WI-84771	 Terminal locking mechanism Housing Retainer WI-84780
13) Main fan motor (99801AA450)	 WI-78771	 Housing Retainer Terminal locking mechanism WI-78780
14) Main fan motor (99801AA460)	 WI-88940	 Housing Terminal locking mechanism WI-88941

Connector replacement

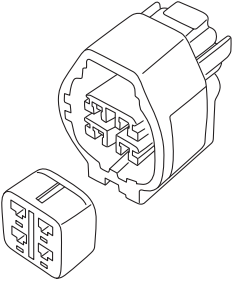
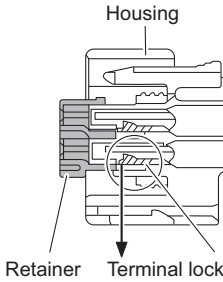
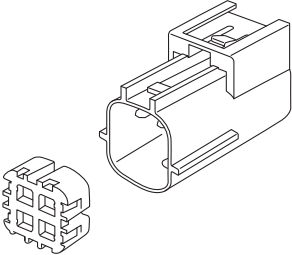
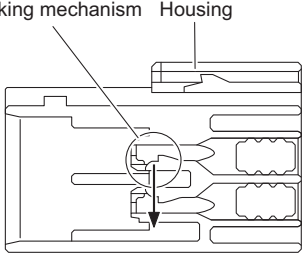
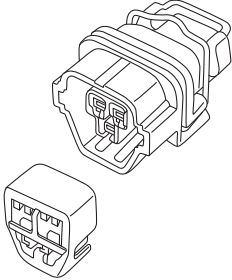
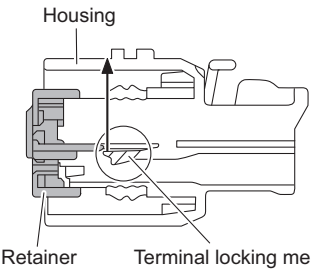
Harness repair manual

Connector type	Connector shape	Cross section
15) Main fan motor harness (99801AA490)	 WI-92427	 WI-92428
16) Sub fan motor (99801AA060)	 WI-78771	 WI-78780
17) Sub fan motor (99801AA130)	 WI-84767	 WI-84781
18) Sub fan motor (99801AA450)	 WI-78771	 WI-78780
19) Sub fan motor (99801AA460)	 WI-88940	 WI-88941

Connector type	Connector shape	Cross section
20) Sub fan motor harness (99801AA490)	 WI-92427	 WI-92428
21) Front harness (99801VC010)	 WI-93599	 WI-93600
22) Front harness (99801VC020)	 WI-93601	 WI-93602
23) Front oxygen (A/F) sensor (99801AA070)	 WI-78772	 WI-78781
24) Front oxygen (A/F) sensor (99801AA140)	 WI-84773	 WI-84782

Connector replacement

Harness repair manual

Connector type	Connector shape	Cross section
25) Rear oxygen sensor (99801AA080)	 WI-78773	 WI-78782
26) Rear oxygen sensor (99801AA150)	 WI-85474	 WI-84782
27) Ignition coil (99801AA090)	 WI-78774	 WI-78783

D: Installing and removing the waterproof plug

- 1) Use a tool such as a hexagonal wrench to pull out and remove the waterproof plug from the front of the connector.

CAUTION:

- Remove any dust or dirt from the waterproof plug.
- Be careful not to damage or break the waterproof plug.

- 2) Push in the waterproof plug straight from the back of the connector to install.

NOTE:

There is no specified installation orientation for waterproof plug.

E: Checking the terminals

- 1) Connect the female terminal directly to the corresponding male terminal and check the terminal contact pressure, the degree of mating, and the weight of sliding movement. Replace the harness assembly if faulty.
- 2) Replace the connecting parts if the male terminal has any deformation or is faulty.

F: Installing the terminals

- 1) Before removing the retainer, insert the terminal straight from the rear of the housing while referring to the record of the connector terminal arrangement and wire colors.

CAUTION:

- Pay attention to the vertical orientation when inserting the terminal.
- Be careful not to assemble the wires erroneously because the same-color wires may be used in one connector.

- 2) Push until you hear a click to indicate that it is locked in place.
- 3) Pull on the harness lightly to confirm that it is appropriately locked in place.
- 4) If the terminal is not properly locked, check for any terminal deformation or damage to the locking mechanism and do the following:
 - Terminal deformation: Replace the harness assembly.
 - Damage to the terminal locking mechanism: Replace the repair harness connector.

G: Installing the retainer

Install the retainer to the housing. For the male housings, install it using a flathead screwdriver.

NOTE:

If you cannot install it to its original position, ensure that you are pressing the terminal against the housing.

CAUTION:

Make sure to check that the retainer is installed securely.

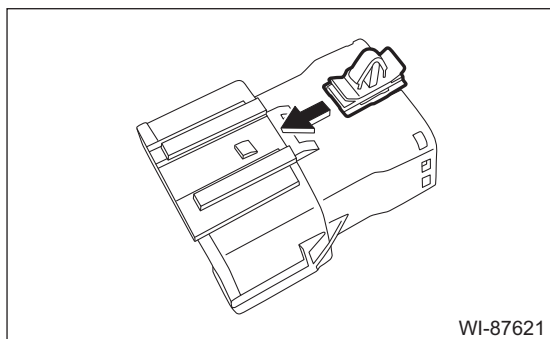
H: Connecting the connector

- 1) Connect the replaced connector.

NOTE:

For the connectors provided with a clip, install the clip.

Insert the clip to the groove of the connector housing, and check for secure installation. (Example shown in the drawing below)



- 2) Secure the harness using a tool such as a clamp to ensure that there is no sagging and it is appropriately supported.

CAUTION:

- Secure it so that it does not interfere with the body end parts, edges, bolts or screws.
- When installing a harness or another component, make sure that nothing is caught on the harness.

- 3) Install the removed parts.

NOTE:

- If you peel off any harness tape, replace it with new tape.
- Restore all removed clips and cable ties to their original positions and orientations.

I: Checking the operation

1) Thoroughly check the operation of the replaced connector.

(1) Check the headlight connector.

1. Turn the ignition and headlight switches to the ON position and gently move the harness and connector in the up, down, left, and right directions. Confirm that the lights do not turn off or flash.

(2) Check the front fog light connector.

1. Turn the ignition and front fog light switches to the ON position and gently move the harness and connector in the up, down, left, and right directions. Confirm that the lights do not turn off or flash.

(3) Check the radiator fan connector.

1. Turn the ignition switch to ON, connect the Subaru Select Monitor and run the radiator fan through an active test.
2. Gently move the harness and connector in the up, down, left, and right directions, and confirm that the fan does not stop running.

(4) Check the daytime running light connector.

1. Turn the ignition switch and daytime running light ON. Gently move the harness and connector in the up, down, left, and right directions and confirm that the light does not turn off or flash.

(5) Check the front oxygen (A/F) sensor and rear oxygen sensor connector.

1. Start the engine and wait until it is warmed up.
2. Connect the Subaru Select Monitor and bring up graphs of the “A/F Sensor #1” and “Bank 1 - Sensor 2 present at that location” values.
3. Gently move the harness and connector in the up, down, left, and right directions, and confirm that there are no abnormalities in the monitored values.

(6) Check the ignition coil connector.

1. Start the engine and wait until it is warmed up.
2. Connect the Subaru Select Monitor, and bring up the graphs for the corresponding values of the “Cylinder Monitor #1”, “Cylinder Monitor #2”, “Cylinder Monitor #3”, and “Cylinder Monitor #4” items in the engine data monitor function.
3. Gently move the harness and connector in the up, down, left, and right directions, and confirm that there is no variation in the monitored values. In addition, check for noise or vibration that indicates engine misfiring.